

Luis Sandoval

Curriculum Vitae

Dr. rer. nat.

Modeling and Simulation Group

Condensed Matter and Materials

Physical and Life Sciences

Lawrence Livermore National Laboratory

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Academic chronology

- Physicist, National University of Colombia (tutor: Prof. Dr. Diógenes Campos, 2001).
- MSc Phys., National University of Colombia (tutor: Prof. Dr. Thomas Dittrich, 2006).
- PhD Phys., University of Kaiserslautern (tutor: Prof. Dr. H. M. Urbassek, 2009).

Previous Research Groups

- Chaos and Complexity Group, Physics Department, National University of Colombia, Bogotá, Colombia.
- Complex Systems Group, Research Center, Antonio Nariño University, Bogotá, Colombia.
- Computational Material Science Group, TU Kaiserslautern, Kaiserslautern, Germany.

Scholarships and Awards

- Undergraduate Scholarship (National University of Colombia).
- Meritorius Mention B.Sc. Thesis.
- MSc Scholarship (Mazda Foundation for Arts and Science, Colombia).
- PhD Scholarship (Graduiertenkolleg 814, Germany).
- PhD Dissertation "mit Auszeichnung" (summa cum laude): Solid-solid phase transitions in iron.

Research Interests

- Molecular Modelling.
- Semiclassical Mechanics.
- Quantum Chemistry.

Publications

- **L. Sandoval** and D. Campos. *Un método para unir las dinámicas clásica y cuántica.* Rev. Acad. Col. Cien. Ex. Fís. Nat., 24, 529 (2000).
- R. Gutiérrez and **L. Sandoval**. *Construcción óptima de modelos a partir de observaciones: aplicación al sistema de Lorenz.* Rev. Col. Fís., 36, 426 (2004).
- R. Gutiérrez and **L. Sandoval**. *A Method to Separate Stochastic and Deterministic Information from Electrocardiograms.* Physica Scripta vT118, 132 (2005).
- T. Dittrich, C. Viviescas and **L. Sandoval**. *Semiclassical propagator of the Wigner function.* Phys. Rev. Lett. 96, 070403 (2006).
- C. Engin, **L. Sandoval** and H. M. Urbassek. *Characterization of Fe potentials with respect to the stability of the bcc and fcc phase.* Modelling Simul. Mater. Sci. Eng. 16, 035005 (2008).
- H. M. Urbassek, C. Anders, **L. Sandoval** and A. K. Upadhyay. *Ultrafast laser irradiation vs cluster ion impact: Molecular-dynamics comparison of materials processes in highly energized solids.* Proc. SPIE **7005**, 700507-1 (2008).
- **L. Sandoval** and H. M. Urbassek. *Sputtering induced by cluster impact on metal targets: influence of electronic stopping.* Nucl. Instr. and Meth. in Phys. Res. B **267**, 2765 (2009).
- **L. Sandoval** and H. M. Urbassek. *Influence of electronic stopping on sputtering induced by cluster impact on metallic targets.* Phys. Rev. B, **79**, 144115 (2009).
- **L. Sandoval** and H. M. Urbassek. *Finite-size effects in Fe-nanowire solid-solid phase transitions: a molecular dynamics approach.* Nano Lett. **9**, 2290 (2009).
- **L. Sandoval** and H. M. Urbassek. *Solid-solid phase transitions in Fe-nanowires induced by axial strain.* Nanotechnology **20**, 325704 (2009).
- **L. Sandoval**, H. M. Urbassek and P. Entel. *The Bain versus Nishiyama-Wassermann path in the martensitic transformation of Fe.* New J. Phys. **11**, 103027 (2009).
- **L. Sandoval** and H. M. Urbassek. *Transformation pathways in the solid-solid phase transitions of iron nanowires.* Appl. Phys. Lett. **95**, 191909 (2009).
- **L. Sandoval**, H. M. Urbassek and P. Entel. *Solid-solid phase transitions and phonon softening in an embedded-atom method model for iron.* Phys. Rev. B **80**, 214108 (2009).
- H. M. Urbassek and **L. Sandoval**. *Molecular dynamics modeling of martensitic transformations.* Submitted (2010).
- **L. Sandoval** et al. *Microstructure evolution in a polycrystalline model for Tantalum* (in preparation).
- **L. Sandoval** et al. *Growth of deformation twins in Tantalum via coherent twin boundary migration* (in preparation).
- **L. Sandoval** et al. *Dynamics of twinning dislocations* (in preparation).
- Y. Gu, L.-Q. Chen, J. Belak and **L. Sandoval**. *Phase field model of deformation twinning in Tantalum: parameterization via molecular dynamics* (in preparation).

Participation in Congresses

- International Conference on Quantum Chaos: Theory and Applications. Cocoyoc, Mexico. Poster: *A method for linking classical and quantum dynamics: application to conservative Duffing oscillator*, (2001).
- Latin American School of Physics ELAF2001. Mexico City, Mexico. Talk: *A method for linking classical and quantum dynamics: application to conservative Duffing oscillator*, (2001).
- XIX Congreso Nacional de Física. Manizales, Colombia. Talk1: *Statistical physics and cardiac diagnosis*. Talk2: *A method for linking classical and quantum dynamics: application to conservative Duffing oscillator*, (2001).
- 6th World Multiconference on Systemics, Cybernetics and Informatics, SCI2002. Orlando, Florida, USA. Talk: *Detecting the stochastic and deterministic information in electrocardiograms*, (2002).
- Encuentro de Métodos Numéricos. Bogotá, Colombia. Talk: *Multiple modeling of chaotic attractors*, (2003).
- XX Congreso Nacional de Física. Armenia, Colombia. Talk: *Optimal modeling: application to the Lorenz system*, (2003).
- VIII Latin American Workshop on Nonlinear Phenomena LAWNP03. Salvador, Bahia, Brasil. Talk: *Detecting stochastic information in Electrocardiograms*, (2003).
- First International Meeting on Applied Physics APHYS03. Badajoz, España. Poster: *A method to separate stochastic and deterministic information from electrocardiograms*, (2003).
- DPG-Spring Meeting of the Division Condensed Matter Physics. Regensburg, Germany. Talk: *Recovering the dynamical system from short and contaminated segments of a chaotic trajectory*, (2004).
- Latin American School of Physics ELAF2005. Leticia, Colombia. Poster: *Recovering dynamical systems from time series*, (2005).
- International Conference on Atomic Collisions in Solids, ICACS-23. Phalaborwa, South Africa. Poster: *Influence of Electronic Stopping on Sputtering Induced by Cluster Impact on Metallic Targets*, (2008).
- Fourth International Conference on Multiscale Materials Modeling, MMM-2008. Tallahassee, Florida, USA. Talk1: *Thermal and Elastic Properties of Fe Nanowires*. Talk2: *Influence of Electronic Stopping on Sputtering Induced by Cluster Impact on Metallic Targets*, (2008).
- Nanotech: Conference and Expo 2009. Houston, Texas, USA. Poster: *Finite-size effects in Fe-nanowire solid-solid phase transitions*, (2009).
- APS March Meeting 2011, Dallas, Texas, USA. Talk: *MD Study of the Nucleation and Growth of Deformation Twins in Polycrystalline Tantalum*, (2011).
- MRS Spring Meeting 2011, San Francisco, California, USA. Talk: *MD Study of the Nucleation and Growth of Deformation Twins in Polycrystalline Tantalum*, (2011).

References

- Dr. David Richards, Condensed Matter and Materials, Lawrence Livermore National Laboratory, Livermore, California, USA. E-mail: richards12@llnl.gov
- Dr. Robert Rudd, Condensed Matter and Materials, Lawrence Livermore National Laboratory, Livermore, California, USA. E-mail: rudd1@llnl.gov
- Dr. Mike Surh, Condensed Matter and Materials, Lawrence Livermore National Laboratory, Livermore, California, USA. E-mail: surh1@llnl.gov
- Prof. Dr. H. M. Urbassek, Computational Material Science, University of Kaiserslautern, Kaiserslautern, Germany. E-mail: urbassek@rhrk.uni-kl.de
- Prof. Dr. Peter Entel, Theoretical Low-Temperature Physics, University of Duisburg-Essen, Duisburg, Germany. E-mail: entel@thp.Uni-DuE.de
- Prof. Dr. Thomas Dittrich, Chaos and Complexity, National University of Colombia, Bogotá, Colombia. E-mail: tdittrich@unal.edu.co

Additional Skills

- Programming: C, C++, Fortran, Python. Admin.: Solaris, Linux.